

Molecular biology (basic level)

Course Workload		Assessment form (examination/ graded test/ ungraded test)
ECTS	Hours	
3	108	Exam

The course is aimed at studying the basic principles of the structure and functioning of biomolecules, as well as their role in the storage and implementation of genetic information.

Course structure:

1. Cells

- 1.1. Chemical basis of life
- 1.2. Cell structure and cell processes
- 1.3. Cell division. Mitosis and meiosis
- 1.4. Cell cycle

2. Genetics, inheritance, DNA

- 2.1. Molecular basis of genetics and inheritance
- 2.2. Central dogma of molecular biology. DNA and RNA functions
- 2.3. DNA replication. Replication processes in prokaryotes and eukaryotes
- 2.4. Transcription and translation
- 2.5. RNA splicing and processing
- 2.6. DNA damage and mutations
- 2.7. DNA repair
- 2.8. Homologous recombination

3. Genes and genomes

- 3.1. Definitions of Gene
- 3.2. Mendel's principles of heredity
- 3.3. Extensions to Mendel's laws
- 3.4. The chromosome theory of inheritance
- 3.5. Gene regulation in prokaryotes and eukaryotes
- 3.6. Genome structure and organization
- 3.7. Chromosome organization
- 3.8. Genome rearrangements

4. Genetic diversity

- 4.1. Sources of genetics diversity
- 4.2. Inbreeding and mutational load